

1 CLAIM:

- 1 1. A cutting tool comprising:
2 a body comprising sintered cemented carbide, cermet or ceramic; and
3 a hard and wear resistant coating on at least functional parts of the body, said
4 coating comprising a structure of one or more refractory layers of which at least one
5 layer comprises an alumina layer having a thickness of 0.5-25 μm , and consisting
6 essentially of single phase α -alumina textured in the [300]-direction with a texture
7 coefficient larger than 1.5, the texture coefficient being defined as:

$$TC(hkl) = \frac{I(hkl)}{I_0(hkl)} \left\{ \frac{1}{n} \sum \frac{I(hkl)}{I_0(hkl)} \right\}^{-1}$$

- 8 where
9 I(hkl) = measured intensity of the (hkl) reflection,
10 I₀(hkl) = standard intensity of the ASTM standard,
11 powder pattern diffraction data, card number 43-1484,
12 n = number of reflections used in the calculation
13 (hkl) reflections used are: (012), (104), (110),
14 (113), (024), (116) and (300).

- 1 2. The cutting tool according to claim 1, wherein the alumina layer has
2 a thickness of 1-10 μm .

1 3. The cutting tool according to claim 1, wherein the texture coefficient
2 is larger than 3.

1 4. The cutting tool according to claim 1, wherein the texture coefficient
2 is larger than 5.

1 5. The cutting tool according to claim 1, wherein the α -alumina layer
2 contains 0.01-10 percent by weight of residues of a texture modifying agent.

1 6. The cutting tool according to claim 5, wherein the α -alumina layer
2 contains 0.01-5 percent by weight of residues of a texture modifying agent.

1 7. The cutting tool according to claim 5, wherein the α -alumina layer
2 contains less than 1 percent by weight of residues of a texture modifying agent.

1 8. The cutting tool according to claim 1, further comprising at least one
2 layer having a thickness of 0.1-10 μm , comprising a nitride, carbide, carbonitride,
3 oxycarbide and/or oxycarbonitride of the metal titanium ($\text{TiC}_x\text{N}_y\text{O}_z$) and that said
4 layer is in contact with the α -alumina layer.

1 9. The cutting tool according to claim 8, wherein the at least one layer
2 has a thickness of 0.5-5 μm .

1 10. The cutting tool according to claim 8, wherein the outer layer is α -
2 alumina.

1 11. The cutting tool according to claim 1, wherein the outer layer is TiN.

1 12. The cutting tool according to claim 1, the surface of the coated
2 cutting tool is smoothened by means of a brushing operation.

1 13. A method of producing a coated cutting tool comprising at least one
2 layer of textured α -alumina, the method comprising:
3 introducing a tool surface to be coated into a reactive atmosphere comprising
4 H_2 and/or Ar;
5 providing the reactive atmosphere with a concentration of oxidizing species
6 below 5 ppm;
7 initiating nucleation of the α -alumina layer on the surface by first introducing
8 HCl and CO_2 gasses into the atmosphere, than introducing $AlCl_3$ gas into the
9 atmosphere;
10 maintaining a temperature of 950-1050°C during nucleation of the α -alumina
11 layer; and
12 introducing a catalyst and a texture modifying agent into the atmosphere
13 during growth of the α -alumina layer.

1 14. The method according to claim 13, wherein the oxidizing species
2 comprises water vapor, the catalyst comprises H_2S , and the texture modifying agent
3 comprises $ZrCl_4$.

1 15. The method according to claim 13, wherein 0.05-10 percent by
2 volume of the texture modifying agent is introduced.

1 16. The method according to claim 13, wherein 0.2-5 percent by volume
2 of the texture modifying agent is introduced.

1 17. The method according to claim 13, wherein 0.5-2 percent by volume
2 of the texture modifying agent is introduced.

1 18. A method according to claim 14, wherein the addition of the texture
2 modifying agent to the reaction gas mixture is 0.05-10 percent by volume of the
3 total reaction gas mixture.

1 19. The method according to claim 18, wherein the addition of the texture
2 modifying agent is 0.2-5 percent by volume of the total reaction gas mixture.

1 20. The method according to claim 18, wherein the addition of the texture
2 modifying agent is 0.5-2 percent by volume of the total reaction gas mixture.